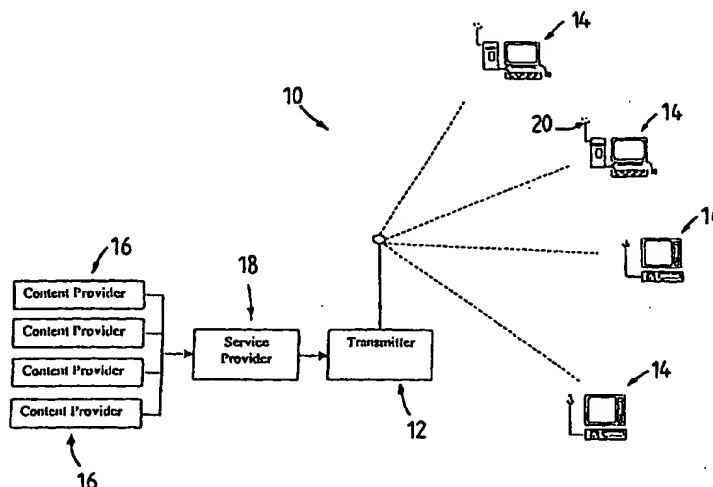




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(21) International Application Number: PCT/ZA99/00005 (22) International Filing Date: 19 March 1999 (19.03.99) (30) Priority Data: 98/2302 19 March 1998 (19.03.98) ZA 99/1811 8 March 1999 (08.03.99) ZA (71)(72) Applicant and Inventor: MOSTERT, Christiaan, Frederik, du Toit [ZA/ZA]; No. 5 Valley Road, Westcliff, Johannesburg 2193 (ZA). (72) Inventors; and (75) Inventors/Applicants (for US only): HIGGINSON, David, Charles [ZA/ZA]; 49 Joseph Avenue, Northcliff, Johannesburg 2115 (ZA). HIGGINSON, Martin, Roy [ZA/ZA]; 52 Bianca Avenue, Berario, Johannesburg 2195 (ZA). NEL, Pierre, Hercules [ZA/ZA]; 502 Tennessee Street, Faerie Glen, Pretoria 0043 (ZA). (74) Agent: D.M. KISCH INC.; P.O. Box 781218, Sandton 2146 (ZA).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: METHOD AND SYSTEM FOR DISTRIBUTING INTERNET TO MULTIPLE USERS



(57) Abstract

The invention provides a system and method for transmitting information to multiple users simultaneously, over a wireless communications network, and for receiving, demodulating, downloading and storing the information at user bases, for access at any future time. The system comprises: one or more content providers (16), such as a news company, stock brokerage firm, Internet service provider, publisher or university; one or more service providers (18) that manage the information into channels; existing wireless transmission infrastructure (12), for example, that used by radio companies, and; a plurality of PC-based receivers (14) at user bases. The user base typically comprises an antenna (20), in conjunction with a specialised radio card designed to implement modulation techniques such as GMSK, QPM and Galaxy Modulation; a modem for demodulating the broadcast signal, and; processing means, such as a personal computer.

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METHOD AND SYSTEM FOR DISTRIBUTING INTERNET TO MULTIPLE USERS

TECHNICAL FIELD

This invention relates to a method and system for simultaneously distributing information to a plurality of user bases. More specifically, it relates to the wireless transmission of information from a broadcaster to multiple receivers for storage and access at the user's convenience.

BACKGROUND ART

With the introduction of the Internet and World Wide Web many users have access to information over the Internet. Although the availability of information has been advanced with so-called web sites, downloading and accessing of information is a time consuming process due to limited data throughput and transfer rates over standard telephone lines.

Modulation techniques that sacrifice signal data for a lower ambient noise threshold while maintaining a relatively high data transfer rate over a fixed bandwidth channel are conventionally used in the telecommunications industry. Examples of these advanced modulation techniques are Gaussian Minimum Shift Keying (GMSK), Quadrature Polyphase Modulation (QPM) and Galaxy Modulation (GM). However, technologic advancements in the field of electronics and the subsequent reduction in the size and cost of electronic components, has enabled these modulation techniques to be implemented in broadcasting systems.

In most instances, it is required that users of information networks purchase a modem and pay monthly subscription fees to an Internet Service Provider (ISP). Subscribers are entitled to dial into an ISP at a Point of Presence (POP), and are subsequently granted access to the information superhighway.

Research has shown that certain pre-registered web sites are favoured above others and are accessed more frequently. It has also revealed that certain favoured web sites are accessed more for the purpose of obtaining information, such as stock prices, news, weather, etc., rather than for purely for entertainment.

The process of logging into an ISP and subsequently being granted access to a web site for downloading information from the site, is tedious and in most cases time-consuming. Furthermore, most users access the Internet during business hours, which is the time when telephone costs are most expensive.

The Internet typically forwards information on a "pull" system which is facilitated by a dial-up connection. The current "Push" system does not allow large quantities of information to be provided to multiple users, due to the limitation of the telecommunications network.

A present dial-up connection to the Internet allows the user to request the service provider to transmit large amounts of information satellite, to avoid lengthly download times. However, the transmission has to be requested by the user and the information is independently sent by the service provider to a specific user for each request.

OBJECTIVES OF THE INVENTION

Accordingly, it is an object of the present invention to provide a system and method for simultaneously broadcasting large quantities of information over the airwaves to a plurality of receivers, as well as for downloading information at a user base with which the above disadvantages of known systems could at least be alleviated.

Furthermore, it is an object of the invention to provide users with a system that may enable and/or facilitate one or more of the following:

- product delivery systems – these are orders placed via the Internet or otherwise for data based products, such as software, which can be delivered effortlessly without time-consuming and costly Internet downloads. The sale of music CD's is a perfect application for the invention as a product delivery system;
- mail delivery notification – alerting the user to the presence of new mail. While

E-mail remains the fastest possible communication platform, most people have access to undedicated telephone systems with the result that the mailbox is checked on an intermittent basis. It is only those ISP subscribers with costly dedicated digital connectivity that are notified of new mail, seconds after it is sent. The invention enables delivery notifications to be broadcast as E-mail is sent, making it possible for the user to log into the Internet and access their mail as it arrives;

- downloads – transfer of information from a web page to a user base. While the Internet offers users an incessant source of free product downloads, the speed and associated costs remain a deterrent. The invention enables requested information to be transmitted inexpensively to a plurality of user bases without the tedious and costly exercise of Internet downloads;
- business information – receiving updates of business orientated information such as share-prices, exchange rates and the like, with the use of a subscription service. Similar systems are already in place in telecommunication systems, once again only effective for those who enjoy dedicated connectivity;
- community and crime prevention applications are also limitless - the timeous delivery of information such as stolen credit card lists, stolen vehicles, missing persons, etc. for the identification of fraud and combating of crime; and
- delivery of internet content to less privileged or rural areas without telecommunications systems and facilities.

DISCLOSURE OF INVENTION

According to a first aspect, the invention provides a system for facilitating the simultaneous transmission of information to multiple user bases over a wireless communications network and for receiving, demodulating, downloading, and storing the

information at the user bases for subsequent retrieval, the system comprising at least one content provider; at least one service provider; a transmission infrastructure; multiple user bases, having receivers consisting of an antenna in conjunction with a receiving card; a modem for demodulating the broadcast signal; and processing means for storing and enabling subsequent access of the information.

The system may include means to manage one or more switchable channels, enabling them to be broadcast selectively to a certain subset of users by activating and/or deactivating a specific channel of information.

The transmitted information signal may incorporate means for encoding or encrypting, the corresponding receiver including means for decoding or decrypting the signal at the user base.

The means for encoding and encrypting may be provided with an encryption algorithm that is a function of the user-specific identification code inherent in the receiver card, and further may be provided with a key obtained on payment of the desired channel subscription, ensuring that only paying subscribers are able to decrypt the signal.

The receiver may have an antenna associated with it as part of a computer module, alternatively, the antenna may be a separate unit connectable with a display and processing device.

The system may include means for compressing the information signal and the user base may include means for decompressing the information after it has been downloaded.

The system may use existing transmission infrastructure such as that used by radio companies.

According to a second aspect of the invention there is provided a method for facilitating the simultaneous transmission of information to multiple user bases over a wireless

communications network and for receiving, demodulating, downloading, and storing the information at the user bases for subsequent retrieval including the steps of collecting information from at least one content provider; classifying and grouping the information into channels; generating a modulated information signal for transmission; broadcasting the modulated information signal over a wireless transmission network; receiving the transmitted information signal at user bases via suitably tuned receivers; demodulating the received information signal; and storing the information for subsequent retrieval.

The method may include a step of automatically refreshing the stored information with an updated version.

The step of modulating the information signal may be achieved using any one or more of modulation techniques selected from the group consisting of Gaussian Minimum Shift Keying (GMSK), Quadrature Polyphase Modulation (QPM) and Galaxy Modulation.

The step of modulating the information signal may include implementing a redundancy check to ensure that the received signal is accurate and to enable a corrupted signal to be reconstructed at the receiver.

BRIEF DESCRIPTION OF DRAWINGS

Preferred embodiments of the invention will now be described by means of non-limiting examples only, with reference to the accompanying diagrams wherein:

- Figure 1: is a block diagram of a first embodiment of the invention, which uses a RF transmission network to distribute information;
- Figure 2: is a block diagram of a second embodiment of the invention, which uses a cellular transmission network to distribute information;
- Figure 3: is a block diagram of a third embodiment of the invention, which uses a satellite transmission network to distribute information;
- Figure 4: is a diagram of a fourth embodiment of the invention where the service provider manages the information into various channels before forwarding it to a transmission network to be broadcast; and

Figure 5: is a block diagram illustrating a system of switches for implementing the selective distribution of information to subscribers, according to the invention.

BEST MODES FOR CARRYING OUT THE INVENTION

Figure 1 shows an embodiment of a system 10 according to the invention, which uses a radio frequency transmitter 12 for distributing information to user bases 14, from one or more content providers 16, which could be an Internet service provider, university or commercial institution such as a firm of stock brokers, magazine company, news network or software developer. Users subscribe or register themselves with a content provider 16 at a fee. The content providers prepare the information to be distributed to their subscribers and forward it to a service provider 18 that manages and classifies the data to be transmitted. Existing transmission infrastructure 12, such as that used by radio companies, is used to broadcast the channels of information. At the user base 14, a PC-based receiving station, comprising an antenna 20, a specialised receiver card in the form of a radio card (not shown) and processing and storage means (not shown), is used to receive, demodulate, process and store the incoming information signal. Downloads are stored and automatically refreshed with up-to-date information. This information is retrieved by the user, and manipulated with appropriate software, such as conventional Internet browsers, customized software packages or applets.

Figure 2 relates, specifically, to the transmission of information to multiple users via a cellular network including one or more service providers 18, which are connected to a cellular network operator 30, and one or more content providers 16. The cellular network operator 30 has multiple transmission areas serviced by base stations 32. At the user base 14, a remote terminal, such as a PC, is equipped with receiver means for receiving the cellular transmission. As in the case of RF broadcasting, the downloaded information is viewed on display means and manipulated with peripheral devices such as a keyboard and/or mouse.

Figure 3 relates, specifically, to the transmission of information to multiple users via a satellite network together with one or more service providers 18, which are connected to the satellite network operator 40, and one or more content providers 16. The satellite network is, in this example, the transmission medium for transmitting the information to a low earth-orbiting satellite, which relays the transmission to multiple users. At the user base, a satellite dish 42 is connected to a PC for display. In another example, it is envisaged that users could download the broadcast with a satellite dish connected to a set-top box.

Figure 4 shows an example of where a service provider 18 manages the content 50 to be broadcast over a wireless communication means 52 for reception by subscribers at their user bases 14.

Figure 5 is a block diagram illustrating the use of one or more switches as part of the managing device. Included in the information management system of the service provider is an electronic switching system 60 that ensures that only paying subscribers have decoding means to subscription channels. The encoding or encryption means is a function of the user access code inherent in the radio card, which enables the selective receiving of information by multiple users, i.e. only paying users are able to decode subscription channels.

While not being part of the receiver, clearly software in the PC is in overall control of the receiver unit. This software provides for various functions including issuing commands to tune the receiver, capture incoming data, decompress the information and decode or decrypt the data based on decryption keys provided to each user on payment of their subscription. Such decryption allows, for example, certain channels to be decoded by the intended recipient and not by other users of the system.

Likewise, prior to transmission by the service provider, suitable encryption and/or compression of data is required as well as directing the data to specific addresses or to general receivers.

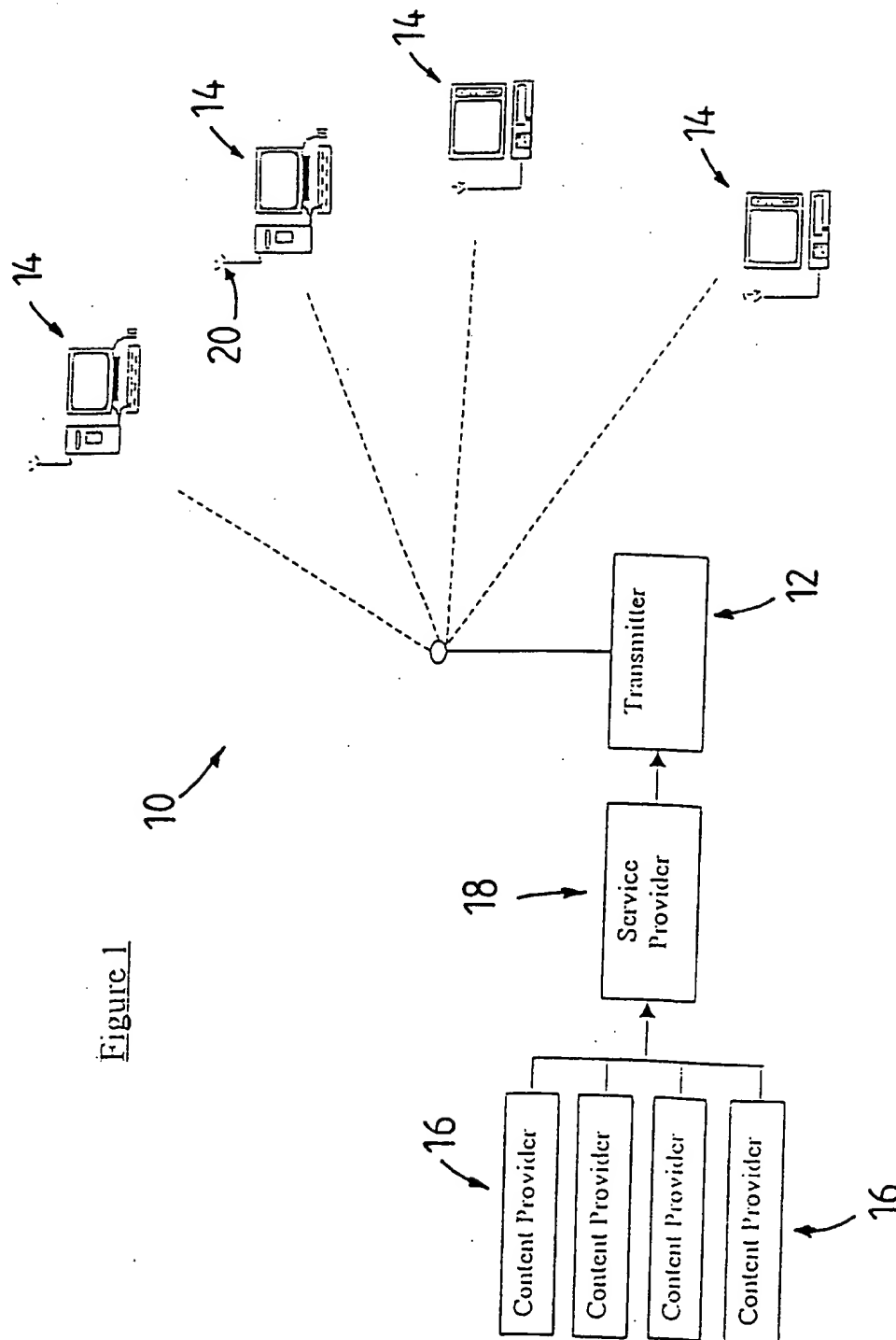
It will be appreciated that certain embodiments of the invention have been described herein and that other embodiments, variations or modifications should therefore be understood to fall within the spirit and scope of the invention as claimed hereafter.

CLAIMS

1. A system for the simultaneous transmission of information to multiple users over a wireless communications network and for receiving, demodulating, downloading and storing the information at user bases, the system comprising at least one content provider; at least one service provider; a transmission infrastructure; multiple user bases, having receivers consisting of an antenna in conjunction with a receiver card; a modem for demodulating the broadcast signal; and processing means for storing and enabling subsequent retrieval of the information.
2. A system according to claim 1 including at least one switchable channel to be broadcast selectively to a subset of users and permitting the activation and or deactivation of a specific channel of information.
3. A system according to claim 1 or 2 including means for encoding the information signal prior to transmission.
4. A system according to claim 1 or 2 including means for encrypting the information signal prior to transmission.
5. A system according to any one of the preceding claims wherein the means for encrypting is a function of the user-specific identification code inherent in the receiver card and a key obtained by the user on payment of the channel subscription.
6. A system according to any one of the previous claims wherein the receiver has an antenna operatively associated therewith.
7. A system according to any one of the preceding claims including means for compressing the information signal prior to transmission and means for decompressing the information after it has been downloaded.
8. A system according to any one of the preceding claims where the transmission network is a radio network.
9. A method for facilitating the simultaneous transmission of information to multiple user bases over a wireless communications network and for receiving, demodulating, downloading, and storing the information at the user bases for subsequent retrieval, the method including the steps of collecting information from at least one content provider; classifying and grouping the information into channels; generating a modulated information signal for transmission; broadcasting the modulated

information signal over a wireless transmission network; receiving the transmitted information signal at user bases via suitably tuned receivers; demodulating the received information signal; and storing the information for subsequent retrieval.

10. A method according to claim 9 including the step of automatically refreshing the stored information with an updated version.
11. A method as claimed in claim 9 or 10 including the step of activating certain channels according to a subscriber's status using software switches at the transmitter.
12. A method as claimed in claim 9 or 10 including the step of activating certain channels according to a subscriber's status by encrypting information as a function of a user-specific identification code.
13. A method as claimed in any one of claims 9 to 12 wherein the step of modulating the information signal is achieved by using any one or more of modulation techniques selected from the group consisting of Gaussian Minimum Shift Keying (GMSK), Quadrature Polyphase Modulation (QPM) and Galaxy Modulation.
14. A method as claimed in claim 13 where the modulation technique includes a redundancy check.



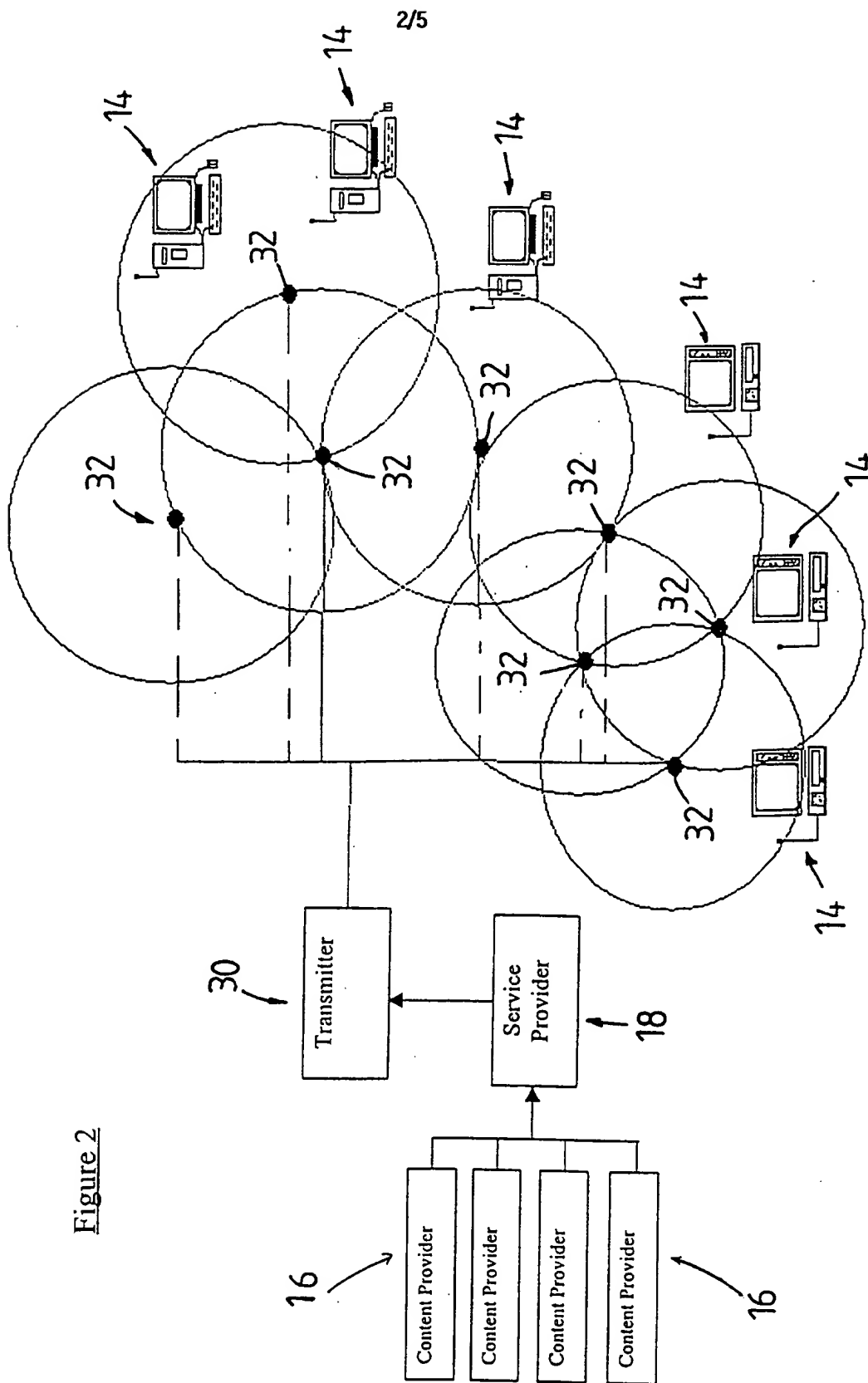


Figure 2

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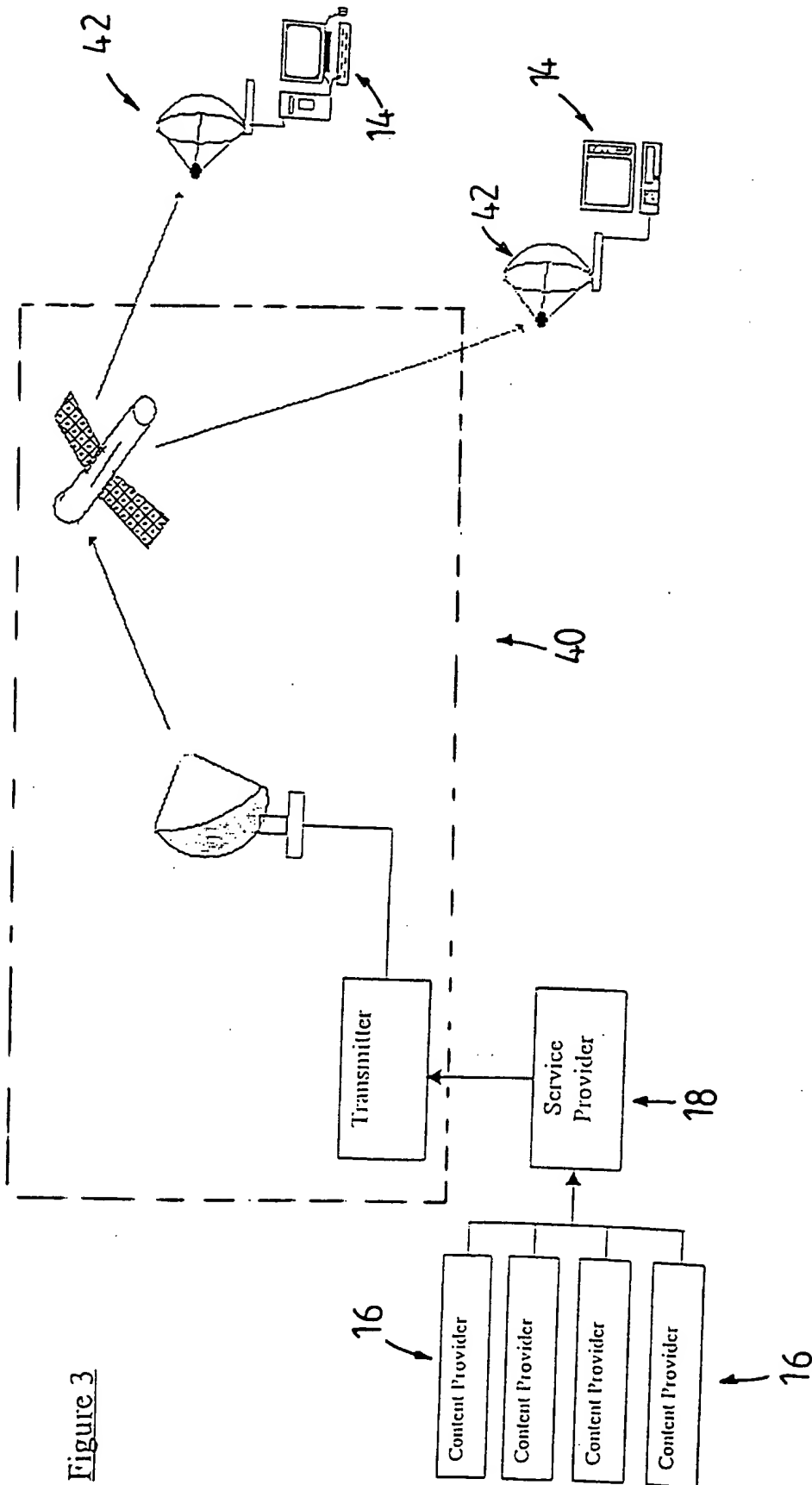
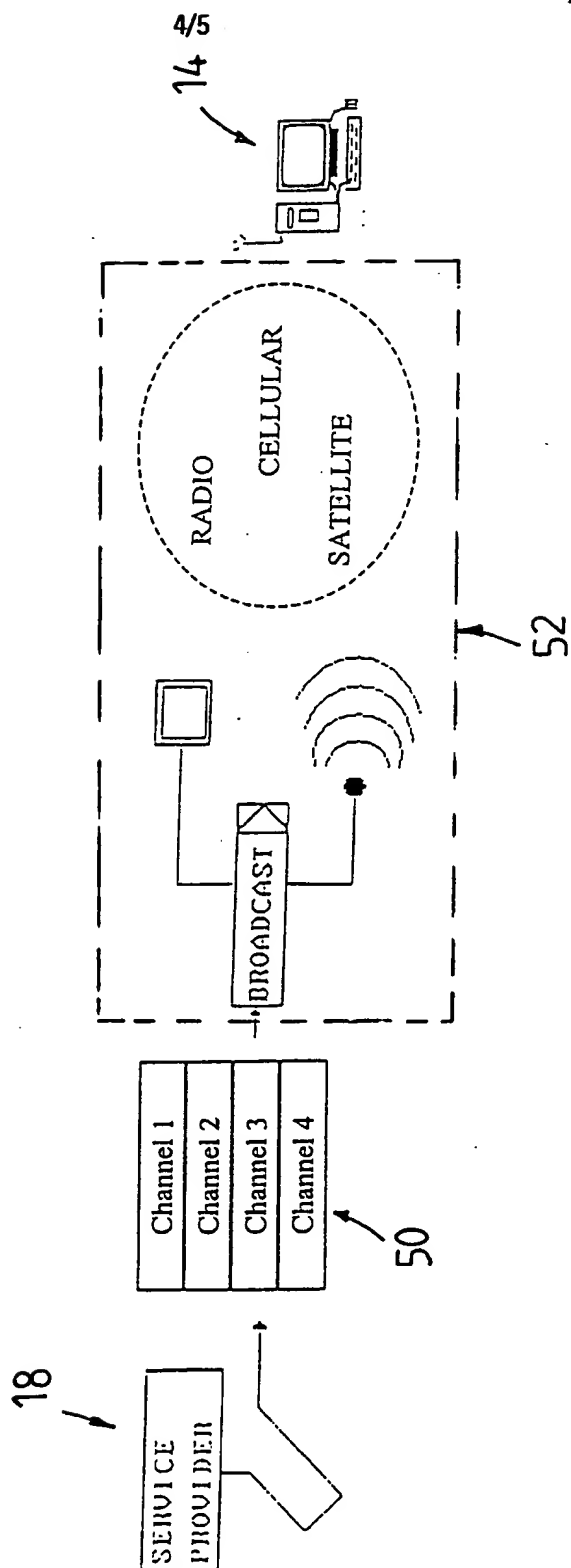


Figure 3

Figure 4



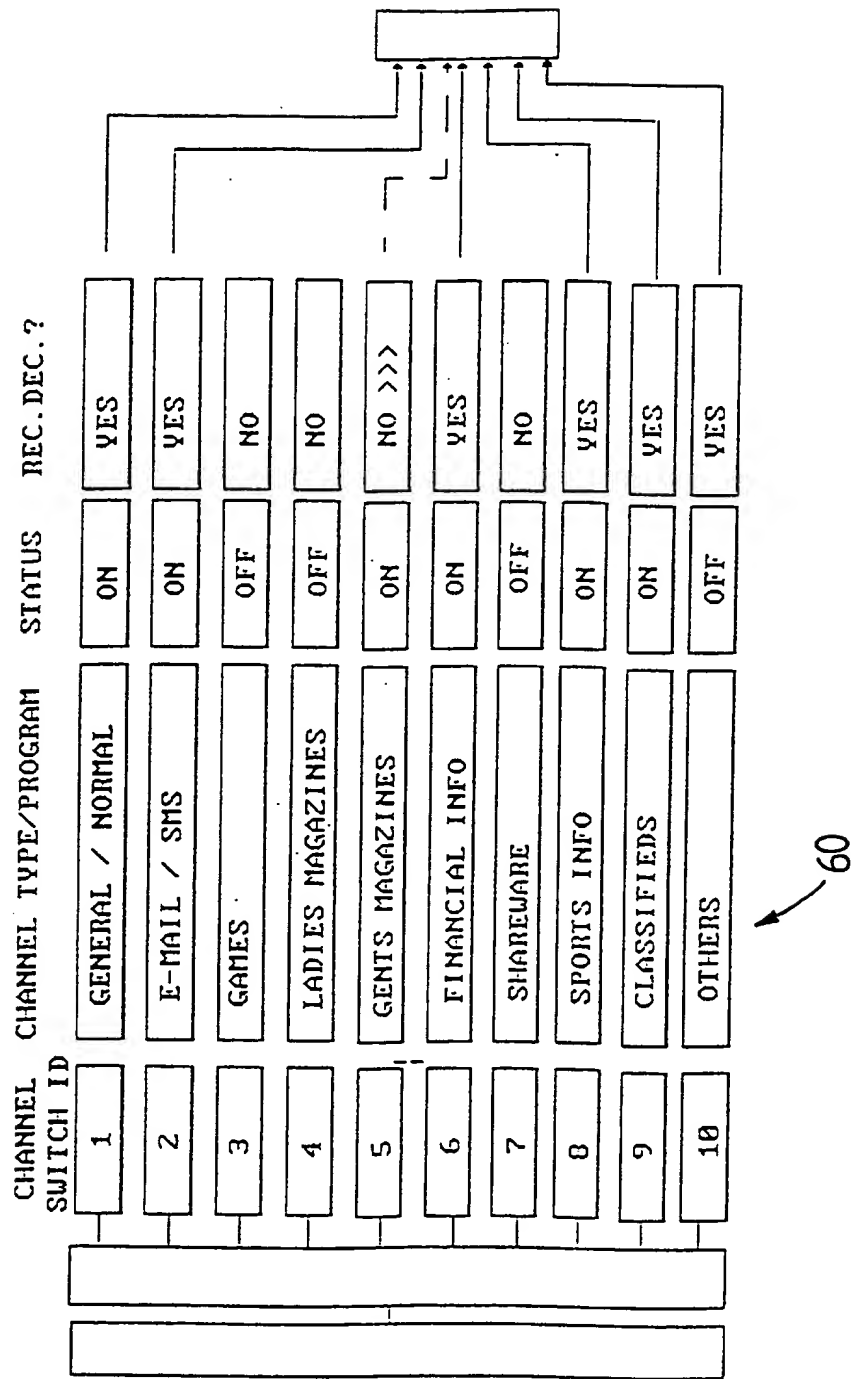


Figure 5

INTERNATIONAL SEARCH REPORT

International Application No

PCT/ZA 99/00005

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04L12/28 G06F1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04L G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 794 642 A (NOKIA MOBILE PHONES LTD) 10 September 1997 (1997-09-10) abstract column 1, line 1 - column 2, line 28 column 7, line 20 - line 43	1,6, 8-10,13
Y	figures 2,3,5,8,10,11	2-4,7, 11,12,14
Y	WO 98 02793 A (ALLIED SIGNAL INC) 22 January 1998 (1998-01-22) abstract page 13, line 5 - page 17, line 9 claims 1-3; figure 1	2-4,7, 11,12,14

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0794642	A	10-09-1997	FI	960894 A	27-08-1997
WO 9802793	A	22-01-1998	EP	0910821 A	28-04-1999